

AD 58-1  
FBI

FBIS-2515/88  
25 April 1988

MEMORANDUM FOR:

[REDACTED]  
Chief, Customer Service Group/OIT

STAT

FROM:

[REDACTED]  
A/Chief, Engineering Support Group/FBIS

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SUBJECT: FBIS' Fiber Optic Upgrade Requirements

REFERENCE: Telecon 11 April 1988

1. The attached report summarizes the background and status of the FBIS to Headquarters fiber optic link. We are very interested in resolving this problem because the facsimile transmission of Pravda and the Soviet equivalent of the 6 o'clock News, Vremya, overlap at approximately 10:00 each morning. Until we reconfigure the fiber optic interface equipment, we cannot process both.

2. Could you please review this report including the possible solution and give us your recommendation for the next step. Our project engineer is [REDACTED] if you have additional questions.

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3. Thanks for your assistance.

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[REDACTED]  
Attachment: As Stated

SUBJECT: FBIS' Fiber Optic Upgrade Requirements

DS&T/FBIS/ESG,  25Apr88

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### Fiber Optic Upgrade Requirements

**Background:** In July 1987, OIT provided FBIS with two full duplex video/audio communication links between 1E66 in HQS and 2S25 in Reston. Both links consist of a coax cable run to fiber optic interface equipment at HQS and Reston. At Reston, the coax cable run is between 2S25 and the Communications room on the first floor, and at HQS the coax cable run is between 1E66 and GJ13. Single mode fiber optic cable is run between the Communication room at Reston and GJ13 at HQS. In the current configuration, each link is only capable of passing one 6MHZ video and one 15KHZ associated audio. Video over both links has never been fully satisfactory because of 60 cycle hum (more fully described in the Problems section below) on each link. FBIS originally requested that the fiber optic interface equipment be located in HQS 1E66 (FBIS equipment racks) and in the Reston TV Center, 2S25. OIT instead located the HQS fiber optic interface equipment in GJ13 and made coaxial cable runs between the two FBIS facilities and the fiber optic interface equipment as spelled out above.

**Requirement:** FBIS originally requested three video/audio communication links from OIT. To save both OIT and FBIS money, the third communication link was dropped and the two present communication links capacity were to be doubled by using Wave Division Multiplexing (1300nm and 1550nm) through the fiber optic equipment. Further, FBIS using its own contractor, Overseas Telecommunications Inc. (OTI), intends to reconfigure the fiber optic interface equipment for a 10MHZ bandwidth so that transmission of a multiplexed 6MHZ video channel with associated audio, 3 additional program audio channels and one wideband Facsimile channel will be possible. This additional capability will satisfy FBIS original needs for data, voice and facsimile between Caversham, England and FBIS HQS in Reston. The reconfiguration of the fiber optic interface equipment cannot be done without first eliminating the 60 cycle hum problem on both links at HQS.

**Problems:** 60 cycle hum is present on both communication links and has subsequently been isolated to the coax run at HQS between 1E66 and GJ13. The source of the 60 cycle hum stems from a ground potential difference between the two power quadrants serving GJ13 and 1E66. Passive video line filters were used to partially suppress the 60 cycle hum by approximately 20-25DB. This provided visually acceptable video but there was attenuation of both the low and high end of the 6MHZ video signal due to filter effects.

Solutions: FBIS is exploring the use of optical video line filters to suppress the 60 cycle hum. Initial investigation with the manufacturer, Video Accessories Corp. (VAC) is positive. Their present optical video isolator is specified with 80DB isolation and a bandwidth of 8MHZ. A VAC engineer advises that the high frequency roll-off on these filters is no more than 3DB at 10MHZ. Tests on two units show about 2.8DB loss at 10MHZ. VAC also states that a 20MHZ filter is going into production and should be ready in about 4 - 6 weeks. The Wide Band Facsimile signal is on 9.2MHZ and using the present 8MHZ video isolators, would most probably require amplification after filtering. If the optical isolators do not solve the 60 cycle hum, or if they create additional problems, then FBIS recommends that OIT move the fiber optic interface equipment from GJ13 to 1E66, to conform with our original plan. A 12 pair single mode fiber could then be run in already existing conduit between GJ13 and 1E66. The fiber optic equipment would then be on the same power quadrant as 1E66 and thereby eliminate the 60 cycle hum and provide a better quality video/audio signal which currently requires equalization because of the long coaxial cable run between GJ13 and 1E66.